

UNITED STATES NAVAL OBSERVATORY  
CIRCULAR NO. 87

U. S. Naval Observatory, Washington 25, D. C.

November 10, 1958

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS

AUGUST, 1957

By Irving W. Lindenblad

These results are based upon measurements made at the Naval Observatory on plates secured either there or at the Mt. Wilson Observatory. The symbols used for the entries in the successive columns are as follows:

U.T., the epoch of observation in Universal Time.

No., the identifying number of the group assigned by Mt. Wilson.

$\Delta l$ , the heliographic difference in longitude from the central meridian, measured positive to the west.

$\varphi$ , the heliographic latitude, measured positive to the north.

$\rho$ , the heliocentric angular distance from the line joining the centers of the Earth and Sun.

$A$ , the true area of the umbra plus penumbra, expressed in millionths of the visible hemisphere.

$s$ , the number of spots.

An asterisk means that no Mt. Wilson number was assigned. Plates secured at the Naval Observatory are indicated by N, and those at Mt. Wilson by M. The plate quality, which follows, is indicated by:

1, Poor; 2, Fair; 3, Good; 4, Very Good; 5, Excellent.

The following five quantities are listed successively at the end of each day, and give for that day:

1. The total number of groups,  $g$ .
2. The longitude of the central meridian,  $L_0$ .
3. The latitude of the center of the disc,  $B_0$ .
4. The total value of  $A$ .
5. The total value of  $s$ .

The mean daily area and the mean relative sunspot number,  $r=10g+s$  are given at the end of the month.

These results are a continuation of those published in the *Monthly Weather Review* from February 1, 1927 to December 31, 1947.



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| U.T.           | No.   | $\Delta l$ | $\varphi$ | $\rho$ | $A$  | $s$ | U.T.            | No.   | $\Delta l$ | $\varphi$ | $\rho$ | $A$ | $s$ |
|----------------|-------|------------|-----------|--------|------|-----|-----------------|-------|------------|-----------|--------|-----|-----|
| 1,517          | 12523 | -79        | +24       | 79     | 12   | 1   | 12514           | +12   | -30        | 38        | 24     | 2   |     |
| N-4            | 12516 | -45        | +25       | 48     | 291  | 5   | 12514           | +14   | -33        | 42        | 727    | 1   |     |
|                | 12516 | -42        | +25       | 45     | 48   | 4   | 12514           | +18   | -28        | 38        | 145    | 1   |     |
|                | 12516 | -39        | +24       | 42     | 24   | 1   | 12514           | +18   | -31        | 41        | 291    | 3   |     |
|                | 12516 | -36        | +25       | 39     | 315  | 4   | 12521           | +30   | +34        | 40        | 97     | 1   |     |
|                | 12518 | -32        | +9        | 32     | 24   | 1   | 12521           | +35   | +33        | 43        | 73     | 2   |     |
|                | 12514 | -11        | -30       | 38     | 800  | 3   | 12525           | +30   | -26        | 43        | 12     | 1   |     |
|                | 12514 | -9         | -32       | 40     | 121  | 1   | 12525           | +33   | -25        | 46        | 24     | 2   |     |
|                | 12521 | +5         | +34       | 29     | 85   | 2   | 12513           | +30   | -28        | 45        | 24     | 1   |     |
|                | 12521 | +6         | +32       | 27     | 48   | 1   | 12513           | +32   | -27        | 47        | 12     | 1   |     |
|                | 12521 | +7         | +34       | 30     | 48   | 1   | 12513           | +33   | -29        | 48        | 291    | 1   |     |
|                | 12521 | +8         | +34       | 30     | 48   | 1   | 12510           | +68   | -12        | 70        | 388    | 1   |     |
|                | 12521 | +10        | +33       | 29     | 61   | 2   |                 |       |            |           |        |     |     |
|                | 12513 | +8         | -29       | 37     | 291  | 1   | (8) (343) (+6)  |       |            |           | 3477   | 49  |     |
|                | 12510 | +42        | -12       | 47     | 315  | 1   |                 |       |            |           |        |     |     |
|                | 12503 | +85        | +15       | 85     | 388  | 1   | 4,606           | 12530 | -62        | -18       | 69     | 24  | 1   |
|                | 12503 | +88        | +13       | 88     | 97   | 1   | M-5             | 12522 | -35        | +8        | 35     | 109 | 5   |
|                |       |            |           |        |      |     |                 | 12522 | -32        | +9        | 32     | 12  | 2   |
| (8) (9) (+6)   |       |            |           |        | 3016 | 31  |                 | 12522 | -30        | +8        | 30     | 12  | 1   |
|                |       |            |           |        |      |     |                 | 12522 | -29        | +9        | 29     | 97  | 1   |
| 2,526          | 12522 | -61        | +8        | 61     | 48   | 1   |                 | 12522 | -28        | +9        | 28     | 24  | 1   |
| N-4            | 12522 | -58        | +8        | 58     | 48   | 4   |                 | 12516 | -7         | +26       | 21     | 121 | 7   |
|                | 12516 | -32        | +24       | 36     | 145  | 5   |                 | 12516 | -6         | +28       | 22     | 61  | 4   |
|                | 12516 | -32        | +26       | 36     | 194  | 3   |                 | 12516 | -4         | +28       | 22     | 24  | 3   |
|                | 12516 | -28        | +25       | 32     | 121  | 5   |                 | 12516 | -1         | +28       | 22     | 121 | 5   |
|                | 12516 | -27        | +25       | 31     | 48   | 2   |                 | 12516 | +5         | +27       | 21     | 388 | 7   |
|                | 12516 | -25        | +25       | 30     | 73   | 1   |                 | 12526 | +22        | -17       | 30     | 12  | 1   |
|                | 12516 | -22        | +26       | 29     | 364  | 5   |                 | 12526 | +28        | -17       | 36     | 48  | 2   |
|                | 12526 | -3         | -17       | 22     | 12   | 1   |                 | 12526 | +32        | -18       | 40     | 36  | 1   |
|                | 12526 | -2         | -15       | 21     | 24   | 1   |                 | 12514 | +27        | -30       | 45     | 776 | 9   |
|                | 12526 | -1         | -16       | 22     | 24   | 1   |                 | 12514 | +31        | -30       | 48     | 48  | 1   |
|                | 12514 | +2         | -30       | 37     | 800  | 4   |                 | 12514 | +32        | -29       | 48     | 24  | 1   |
|                | 12514 | +4         | -32       | 39     | 145  | 3   |                 | 12531 | +32        | +12       | 32     | 12  | 1   |
|                | 12514 | +8         | -29       | 37     | 48   | 1   |                 | 12531 | +33        | +14       | 34     | 12  | 1   |
|                | 12521 | +17        | +34       | 32     | 97   | 1   |                 | 12531 | +36        | +12       | 36     | 12  | 1   |
|                | 12521 | +18        | +32       | 31     | 85   | 3   |                 | 12531 | +37        | +13       | 37     | 12  | 1   |
|                | 12521 | +19        | +35       | 34     | 48   | 2   |                 | 12525 | +42        | -27       | 53     | 48  | 2   |
|                | 12521 | +21        | +33       | 34     | 48   | 1   |                 | 12525 | +44        | -27       | 55     | 61  | 2   |
|                | 12521 | +24        | +32       | 36     | 24   | 1   |                 | 12525 | +48        | -26       | 57     | 36  | 1   |
|                | 12525 | +18        | -26       | 37     | 12   | 1   |                 | 12521 | +44        | +34       | 51     | 73  | 1   |
|                | 12525 | +20        | -26       | 38     | 145  | 1   |                 | 12521 | +46        | +32       | 51     | 12  | 1   |
|                | 12513 | +21        | -29       | 40     | 267  | 1   |                 | 12521 | +51        | +32       | 56     | 24  | 2   |
|                | 12524 | +36        | +25       | 40     | 24   | 1   |                 | 12513 | +47        | -29       | 58     | 242 | 1   |
|                | 12524 | +38        | +25       | 41     | 24   | 1   |                 | 12513 | +49        | -28       | 59     | 48  | 1   |
|                | 12510 | +54        | -12       | 58     | 339  | 1   |                 | 12510 | +88        | -13       | 88     | 242 | 1   |
| (9) (356) (+6) |       |            |           |        | 3207 | 51  | (10) (328) (+6) |       |            |           | 2771   | 68  |     |
| 3,523          | 12522 | -48        | +8        | 48     | 194  | 4   | 5,520           | 12534 | -76        | -15       | 79     | 121 | 1   |
| N-2            | 12522 | -46        | +8        | 46     | 24   | 2   | N-4             | 12532 | -63        | -22       | 70     | 48  | 1   |
|                | 12522 | -43        | +8        | 43     | 73   | 3   |                 | 12532 | -61        | -21       | 69     | 48  | 1   |
|                | 12516 | -20        | +25       | 27     | 121  | 4   |                 | 12532 | -59        | -23       | 67     | 48  | 1   |
|                | 12516 | -20        | +27       | 28     | 73   | 1   |                 | 12530 | -48        | -19       | 55     | 48  | 2   |
|                | 12516 | -19        | +28       | 28     | 97   | 1   |                 | 12533 | -23        | +13       | 24     | 24  | 1   |
|                | 12516 | -18        | +25       | 26     | 73   | 3   |                 | 12522 | -22        | +7        | 22     | 73  | 2   |
|                | 12516 | -17        | +27       | 26     | 73   | 2   |                 | 12522 | -20        | +8        | 20     | 73  | 2   |
|                | 12516 | -16        | +28       | 27     | 61   | 1   |                 | 12522 | -17        | +8        | 17     | 242 | 3   |
|                | 12516 | -15        | +26       | 24     | 48   | 1   |                 | 12516 | +7         | +25       | 21     | 97  | 5   |
|                | 12516 | -12        | +26       | 22     | 48   | 1   |                 | 12516 | +10        | +27       | 22     | 145 | 2   |
|                | 12516 | -12        | +28       | 24     | 24   | 1   |                 | 12516 | +14        | +27       | 23     | 145 | 2   |
|                | 12516 | -9         | +26       | 21     | 291  | 2   |                 | 12516 | +17        | +27       | 26     | 339 | 2   |
|                | 12526 | +8         | -17       | 23     | 48   | 1   |                 | 12516 | +21        | +26       | 28     | 24  | 1   |
|                | 12526 | +8         | -18       | 24     | 12   | 1   |                 | 12526 | +33        | -14       | 40     | 12  | 1   |
|                | 12526 | +9         | -18       | 25     | 12   | 1   |                 | 12526 | +33        | -17       | 40     | 24  | 1   |
|                | 12526 | +12        | -16       | 26     | 97   | 3   |                 | 12526 | +39        | -15       | 44     | 24  | 2   |



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| U. T. | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ |
|-------|-------|------------|------------|------------|------|-----|--------|-------|------------|------------|------------|------|-----|
|       |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |
|       | 12526 | +42        | -15        | 48         | 48   | 2   |        | 12516 | +37        | +27        | 41         | 73   | 1   |
|       | 12514 | +39        | -29        | 51         | 897  | 3   |        | 12516 | +39        | +26        | 42         | 61   | 1   |
|       | 12514 | +44        | -29        | 58         | 61   | 1   |        | 12516 | +42        | +27        | 47         | 388  | 2   |
|       | 12514 | +46        | -28        | 57         | 24   | 1   |        | 12516 | +43        | +24        | 48         | 85   | 1   |
|       | 12525 | +50        | -25        | 59         | 48   | 3   |        | 12516 | +45        | +25        | 48         | 61   | 2   |
|       | 12525 | +54        | -24        | 61         | 194  | 1   |        | 12537 | +32        | +14        | 33         | 48   | 1   |
|       | 12525 | +56        | -25        | 63         | 61   | 4   |        | 12537 | +32        | +16        | 33         | 12   | 1   |
|       | 12525 | +56        | -23        | 62         | 12   | 1   |        | 12537 | +35        | +15        | 36         | 61   | 1   |
|       | 12525 | +58        | -24        | 65         | 48   | 2   |        | 12514 | +65        | -28        | 72         | 1018 | 2   |
|       | 12521 | +55        | +35        | 60         | 48   | 1   |        | 12525 | +85        | -24        | 88         | 97   | 1   |
|       | 12513 | +58        | -28        | 67         | 291  | 1   |        | 12525 | +85        | -25        | 88         | 97   | 1   |
|       | (11)  | (316)      | (+6)       |            | 3267 | 50  |        | (12)  | (290)      | (+6)       |            | 3307 | 39  |
| 6,517 | 12535 | -70        | -36        | 79         | 97   | 1   | 8,540  | 12540 | -72        | +10        | 72         | 339  | 1   |
| N-3   | 12535 | -70        | -37        | 79         | 145  | 1   | N-2    | 12535 | -43        | -37        | 60         | 121  | 4   |
|       | 12534 | -60        | -15        | 66         | 97   | 1   |        | 12534 | -32        | -14        | 39         | 61   | 1   |
|       | 12532 | -49        | -24        | 58         | 12   | 1   |        | 12532 | -21        | -24        | 38         | 12   | 1   |
|       | 12532 | -46        | -20        | 53         | 24   | 1   |        | 12532 | -19        | -25        | 37         | 85   | 2   |
|       | 12539 | -14        | +27        | 25         | 12   | 1   |        | 12532 | -18        | -21        | 32         | 121  | 1   |
|       | 12533 | -10        | +13        | 12         | 12   | 1   |        | 12533 | +17        | +12        | 18         | 36   | 1   |
|       | 12522 | -11        | +8         | 12         | 12   | 1   |        | 12533 | +19        | +12        | 20         | 48   | 1   |
|       | 12522 | -8         | +8         | 8          | 121  | 3   |        | 12541 | +20        | -15        | 29         | 24   | 1   |
|       | 12522 | -2         | +8         | 3          | 194  | 2   |        | 12541 | +22        | -14        | 30         | 48   | 1   |
|       | 12538 | +7         | +30        | 24         | 24   | 1   |        | 12522 | +23        | +8         | 23         | 24   | 1   |
|       | 12538 | +8         | +32        | 27         | 12   | 1   |        | 12522 | +24        | +9         | 24         | 194  | 1   |
|       | 12538 | +9         | +30        | 25         | 48   | 2   |        | 12537 | +44        | +15        | 45         | 48   | 1   |
|       | 12537 | +19        | +17        | 21         | 12   | 1   |        | 12537 | +50        | +15        | 51         | 97   | 1   |
|       | 12537 | +21        | +15        | 22         | 36   | 1   |        | 12516 | +49        | +28        | 51         | 242  | 1   |
|       | 12516 | +22        | +27        | 30         | 121  | 2   |        | 12516 | +51        | +28        | 54         | 230  | 1   |
|       | 12516 | +23        | +28        | 31         | 61   | 1   |        | 12516 | +56        | +28        | 58         | 485  | 3   |
|       | 12516 | +27        | +27        | 32         | 12   | 1   |        | 12516 | +56        | +24        | 57         | 121  | 2   |
|       | 12516 | +28        | +27        | 33         | 145  | 1   |        | 12516 | +59        | +26        | 61         | 133  | 2   |
|       | 12516 | +29        | +24        | 33         | 48   | 1   |        | 12514 | +80        | -28        | 87         | 873  | 1   |
|       | 12516 | +30        | +27        | 35         | 242  | 2   |        | (10)  | (276)      | (+6)       |            | 3342 | 28  |
|       | 12536 | +22        | +12        | 23         | 12   | 1   | 9,554  | 12546 | -75        | +9         | 75         | 48   | 2   |
|       | 12536 | +24        | +12        | 25         | 12   | 1   | N-4    | 12543 | -70        | -12        | 74         | 145  | 1   |
|       | (*)   | +34        | +26        | 39         | 12   | 1   |        | 12542 | -58        | -20        | 64         | 24   | 1   |
|       | 12518 | +38        | +11        | 38         | 12   | 1   |        | 12540 | -58        | +10        | 58         | 315  | 3   |
|       | 12514 | +52        | -29        | 63         | 897  | 2   |        | 12545 | -43        | +14        | 44         | 36   | 1   |
|       | 12514 | +56        | -29        | 66         | 291  | 3   |        | 12535 | -29        | -37        | 52         | 48   | 3   |
|       | 12531 | +60        | +14        | 60         | 48   | 1   |        | 12534 | -19        | -15        | 28         | 48   | 2   |
|       | 12531 | +63        | +14        | 63         | 48   | 1   |        | 12532 | -11        | -23        | 31         | 12   | 2   |
|       | 12521 | +68        | +34        | 68         | 24   | 1   |        | 12532 | -8         | -24        | 32         | 12   | 1   |
|       | 12525 | +67        | -24        | 72         | 291  | 2   |        | 12532 | -7         | -25        | 32         | 48   | 3   |
|       | 12525 | +70        | -24        | 75         | 121  | 1   |        | 12532 | -3         | -21        | 28         | 97   | 2   |
|       | 12525 | +74        | -24        | 78         | 145  | 1   |        | 12544 | -9         | -12        | 21         | 48   | 2   |
|       | 12513 | +72        | -28        | 78         | 388  | 1   |        | 12522 | +37        | +8         | 37         | 24   | 2   |
|       | (17)  | (303)      | (+6)       |            | 3788 | 44  |        | 12522 | +39        | +9         | 39         | 170  | 1   |
| 7,530 | 12540 | -87        | +11        | 87         | 485  | 1   |        | 12537 | +58        | +16        | 59         | 48   | 2   |
| N-4   | 12535 | -56        | -37        | 68         | 145  | 3   |        | 12516 | +61        | +27        | 63         | 48   | 1   |
|       | 12534 | -47        | -14        | 51         | 73   | 1   |        | 12516 | +62        | +28        | 64         | 121  | 1   |
|       | 12532 | -34        | -23        | 47         | 48   | 1   |        | 12516 | +68        | +27        | 69         | 194  | 1   |
|       | 12532 | -32        | -21        | 43         | 48   | 1   |        | 12516 | +70        | +27        | 70         | 73   | 1   |
|       | 12530 | -9         | -10        | 18         | 12   | 1   |        | 12516 | +70        | +28        | 70         | 145  | 1   |
|       | 12533 | +3         | +12        | 8          | 48   | 1   |        | 12516 | +71        | +27        | 71         | 145  | 3   |
|       | 12533 | +5         | +12        | 9          | 24   | 1   |        | (12)  | (263)      | (+6)       |            | 1849 | 36  |
|       | 12522 | +6         | +7         | 5          | 48   | 3   | 10,733 | 12543 | -62        | -9         | 67         | 36   | 1   |
|       | 12522 | +11        | +8         | 11         | 194  | 2   | M-2    | 12543 | -61        | -11        | 67         | 61   | 1   |
|       | 12538 | +22        | +30        | 31         | 48   | 4   |        | 12543 | -58        | -9         | 61         | 194  | 1   |
|       | 12516 | +29        | +27        | 35         | 24   | 1   |        | 12543 | -57        | -13        | 60         | 36   | 1   |
|       | 12516 | +33        | +28        | 39         | 36   | 1   |        |       |            |            |            |      |     |
|       | 12516 | +35        | +25        | 40         | 73   | 4   |        |       |            |            |            |      |     |



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| U.T.   | No.             | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U.T.   | No.             | $\Delta l$ | $\varphi$  | $\rho$     | $A$ | $s$ |
|--------|-----------------|------------|------------|------------|------|-----|--------|-----------------|------------|------------|------------|-----|-----|
|        |                 | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |        |                 | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |     |     |
|        | 12546           | -60        | +12        | 60         | 48   | 2   |        | 12545           | +9         | +17        | 13         | 267 | 1   |
|        | 12542           | -45        | -18        | 52         | 24   | 1   |        | 12532           | +49        | -19        | 55         | 48  | 2   |
|        | 12540           | -43        | +11        | 43         | 36   | 1   |        |                 |            |            |            |     |     |
|        | 12540           | -43        | +12        | 43         | 230  | 1   |        | (10) (210) (+7) |            |            | 2107       | 23  |     |
|        | 12545           | -32        | +17        | 33         | 61   | 4   |        |                 |            |            |            |     |     |
|        | 12545           | -31        | +16        | 32         | 24   | 1   | 14,540 | 12556           | -87        | +32        | 87         | 242 | 1   |
|        | 12545           | -28        | +17        | 29         | 97   | 6   | N-2    | 12561           | -67        | -26        | 74         | 97  | 1   |
|        | 12534           | -6         | -12        | 19         | 24   | 1   |        | 12552           | -57        | -34        | 68         | 388 | 4   |
|        | 12534           | -4         | -12        | 19         | 24   | 1   |        | 12552           | -50        | -33        | 63         | 48  | 1   |
|        | 12534           | -4         | -13        | 20         | 24   | 1   |        | 12548           | -40        | +21        | 42         | 242 | 1   |
|        | 12534           | -3         | -12        | 19         | 12   | 1   |        | 12549           | -17        | -10        | 22         | 145 | 1   |
|        | 12532           | +11        | -20        | 28         | 73   | 2   |        | 12549           | -15        | -11        | 23         | 145 | 1   |
|        | 12522           | +56        | +9         | 56         | 194  | 1   |        | 12543           | -7         | -9         | 17         | 24  | 1   |
|        | 12516           | +88        | +27        | 88         | 242  | 1   |        | 12543           | -6         | -8         | 16         | 12  | 1   |
|        | (9) (247) (+6)  |            |            |            | 1440 | 28  |        | 12543           | -4         | -9         | 16         | 61  | 4   |
| 11,604 | 12548           | -79        | +21        | 79         | 388  | 1   |        | 12555           | -5         | +14        | 10         | 73  | 1   |
| N-1    | 12543           | -43        | -10        | 48         | 194  | 1   |        | 12542           | +6         | -19        | 27         | 36  | 1   |
|        | 12542           | -32        | -19        | 41         | 48   | 1   |        | 12550           | +7         | -32        | 39         | 36  | 1   |
|        | 12540           | -32        | +14        | 32         | 48   | 1   |        | 12550           | +8         | -32        | 39         | 48  | 1   |
|        | 12540           | -31        | +12        | 31         | 291  | 1   |        | 12550           | +9         | -32        | 39         | 36  | 1   |
|        | 12540           | -31        | +11        | 31         | 48   | 1   |        | 12550           | +12        | -31        | 39         | 145 | 1   |
|        | 12545           | -21        | +16        | 23         | 218  | 1   |        | 12540           | +7         | +15        | 11         | 97  | 1   |
|        | 12545           | -19        | +14        | 21         | 73   | 1   |        | 12540           | +8         | +17        | 13         | 121 | 2   |
|        | 12545           | -17        | +15        | 18         | 145  | 1   |        | 12540           | +8         | +12        | 11         | 315 | 1   |
|        | 12547           | -5         | -15        | 22         | 24   | 1   |        | 12540           | +9         | +16        | 13         | 48  | 1   |
|        | 12532           | +24        | -19        | 36         | 97   | 1   |        | 12545           | +17        | +18        | 20         | 194 | 2   |
|        | 12522           | +68        | +10        | 68         | 291  | 1   |        | 12545           | +18        | +17        | 21         | 73  | 1   |
|        | (8) (236) (+6)  |            |            |            | 1865 | 12  |        | 12545           | +21        | +17        | 23         | 36  | 1   |
| 12,532 | 12552           | -78        | -33        | 85         | 291  | 2   |        | 12545           | +22        | +17        | 25         | 145 | 1   |
| N-3    | 12548           | -67        | +20        | 68         | 291  | 1   |        | 12554           | +32        | -16        | 39         | 61  | 1   |
|        | 12549           | -44        | -10        | 49         | 48   | 2   |        | 12554           | +33        | -14        | 39         | 24  | 1   |
|        | 12551           | -39        | +12        | 40         | 24   | 1   |        | 12554           | +35        | -14        | 40         | 61  | 1   |
|        | 12543           | -32        | -10        | 37         | 48   | 1   |        | (12) (197) (+7) |            |            | 2953       | 35  |     |
|        | 12543           | -31        | -10        | 37         | 61   | 3   | 15,600 | 12562           | -82        | +9         | 82         | 194 | 1   |
|        | 12542           | -20        | -19        | 32         | 36   | 1   | N-3    | 12562           | -81        | +12        | 81         | 194 | 1   |
|        | 12540           | -19        | +12        | 20         | 242  | 1   |        | 12556           | -72        | +32        | 72         | 145 | 1   |
|        | 12540           | -18        | +11        | 19         | 36   | 1   |        | 12561           | -52        | -26        | 62         | 12  | 1   |
|        | 12550           | -19        | -32        | 42         | 12   | 1   |        | 12560           | -50        | -43        | 68         | 12  | 1   |
|        | 12550           | -17        | -31        | 41         | 24   | 1   |        | 12559           | -46        | +13        | 46         | 24  | 1   |
|        | 12545           | -9         | +17        | 13         | 242  | 4   |        | 12552           | -43        | -34        | 60         | 97  | 1   |
|        | 12545           | -6         | +15        | 11         | 73   | 4   |        | 12552           | -42        | -35        | 59         | 73  | 1   |
|        | 12545           | -4         | +16        | 11         | 170  | 3   |        | 12552           | -41        | -36        | 59         | 97  | 1   |
|        | 12532           | +32        | -19        | 41         | 24   | 1   |        | 12552           | -41        | -32        | 57         | 12  | 1   |
|        | 12532           | +34        | -19        | 42         | 24   | 1   |        | 12552           | -37        | -33        | 53         | 12  | 2   |
|        | 12522           | +80        | +10        | 80         | 242  | 1   |        | 12553           | -42        | -22        | 52         | 24  | 1   |
|        | (11) (224) (+7) |            |            |            | 1888 | 29  |        | 12558           | -37        | -19        | 45         | 24  | 1   |
| 13,539 | 12552           | -68        | -33        | 76         | 194  | 1   |        | 12558           | -36        | -18        | 42         | 24  | 1   |
| N-2    | 12552           | -68        | -34        | 76         | 97   | 1   |        | 12548           | -27        | +21        | 29         | 267 | 1   |
|        | 12552           | -68        | -35        | 77         | 145  | 1   |        | 12549           | -2         | -10        | 17         | 170 | 2   |
|        | 12548           | -52        | +20        | 53         | 242  | 1   |        | 12557           | +2         | -5         | 12         | 48  | 1   |
|        | 12549           | -29        | -10        | 33         | 121  | 1   |        | 12557           | +2         | -8         | 13         | 48  | 1   |
|        | (*)             | -22        | +1         | 23         | 24   | 1   |        | 12557           | +3         | -8         | 13         | 48  | 1   |
|        | 12543           | -20        | -11        | 27         | 194  | 2   |        | 12557           | +5         | -8         | 14         | 48  | 2   |
|        | 12543           | -18        | -10        | 25         | 97   | 1   |        | 12557           | +7         | -5         | 13         | 24  | 1   |
|        | 12542           | -8         | -18        | 25         | 24   | 2   |        | 12543           | +10        | -9         | 18         | 48  | 1   |
|        | 12540           | -6         | +12        | 9          | 291  | 3   |        | 12542           | +19        | -20        | 32         | 24  | 1   |
|        | 12550           | -7         | -32        | 40         | 48   | 2   |        | 12540           | +21        | +15        | 23         | 61  | 1   |
|        | 12550           | -1         | -31        | 39         | 121  | 1   |        | 12540           | +22        | +11        | 22         | 267 | 1   |
|        | 12545           | +3         | +18        | 12         | 194  | 3   |        | 12540           | +23        | +16        | 26         | 61  | 2   |
|        |                 |            |            |            |      |     |        | 12550           | +22        | -29        | 41         | 36  | 1   |
|        |                 |            |            |            |      |     |        | 12550           | +28        | -32        | 48         | 73  | 1   |
|        |                 |            |            |            |      |     |        | 12545           | +30        | +19        | 32         | 48  | 1   |
|        |                 |            |            |            |      |     |        | 12545           | +31        | +18        | 33         | 24  | 1   |



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| U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ |
|--------|-------|------------|------------|------------|------|-----|--------|-------|------------|------------|------------|------|-----|
|        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |
|        | 12545 | +37        | +17        | 38         | 109  | 1   |        | 12566 | +1         | +19        | 12         | 48   | 1   |
|        | 12554 | +45        | -16        | 50         | 121  | 2   |        | 12566 | +3         | +18        | 11         | 48   | 1   |
|        | 12554 | +50        | -15        | 55         | 170  | 3   |        | 12548 | +3         | +21        | 14         | 218  | 1   |
|        | (17)  | (183)      | (+7)       |            | 2639 | 40  |        | 12540 | +52        | +10        | 52         | 194  | 2   |
| 16,527 | 12563 | -77        | +19        | 77         | 194  | 3   |        | 12545 | +62        | +12        | 62         | 97   | 1   |
| N-4    | 12563 | -72        | +17        | 72         | 339  | 2   |        | 12545 | +67        | +15        | 67         | 97   | 1   |
|        | 12563 | -70        | +15        | 69         | 485  | 3   |        | 12545 | +68        | +11        | 68         | 73   | 1   |
|        | 12562 | -70        | +8         | 70         | 145  | 1   |        | 12545 | +69        | +12        | 69         | 73   | 1   |
|        | 12562 | -69        | +10        | 69         | 36   | 1   |        | 12554 | +78        | -18        | 79         | 582  | 2   |
|        | 12562 | -69        | +11        | 69         | 48   | 1   |        | (11)  | (153)      | (+7)       |            | 4057 | 32  |
|        | 12556 | -61        | +32        | 63         | 121  | 1   | 18,602 | 12568 | -74        | +12        | 75         | 194  | 1   |
|        | 12561 | -46        | -27        | 56         | 36   | 1   | N-1    | 12563 | -50        | +21        | 50         | 170  | 1   |
|        | 12561 | -44        | -29        | 56         | 36   | 1   |        | 12563 | -48        | +18        | 48         | 315  | 1   |
|        | 12565 | -39        | +30        | 42         | 12   | 1   |        | 12563 | -43        | +18        | 43         | 242  | 1   |
|        | 12565 | -37        | +30        | 41         | 12   | 1   |        | 12563 | -43        | +16        | 43         | 339  | 2   |
|        | 12553 | -39        | -25        | 50         | 12   | 1   |        | 12563 | -42        | +11        | 42         | 121  | 1   |
|        | 12553 | -35        | -22        | 46         | 61   | 1   |        | 12563 | -41        | +16        | 41         | 145  | 1   |
|        | 12553 | -32        | -22        | 44         | 61   | 1   |        | 12556 | -33        | +33        | 40         | 97   | 1   |
|        | 12552 | -31        | -33        | 50         | 97   | 1   |        | 12553 | -10        | -22        | 31         | 412  | 2   |
|        | 12552 | -30        | -34        | 50         | 48   | 1   |        | 12553 | -8         | -23        | 31         | 194  | 1   |
|        | 12552 | -29        | -35        | 50         | 133  | 1   |        | 12553 | -3         | -22        | 30         | 267  | 1   |
|        | 12564 | -23        | +24        | 29         | 12   | 1   |        | 12552 | -7         | -32        | 40         | 242  | 3   |
|        | 12558 | -20        | -22        | 25         | 61   | 2   |        | 12558 | +2         | -22        | 30         | 194  | 1   |
|        | 12548 | -14        | +21        | 20         | 194  | 1   |        | 12558 | +7         | -21        | 29         | 121  | 1   |
|        | 12543 | +22        | -8         | 27         | 24   | 3   |        | 12558 | +10        | -22        | 31         | 242  | 1   |
|        | 12540 | +32        | +15        | 33         | 12   | 1   |        | 12548 | +12        | +21        | 19         | 242  | 1   |
|        | 12540 | +33        | +16        | 33         | 12   | 1   |        | 12540 | +62        | +9         | 62         | 242  | 1   |
|        | 12540 | +34        | +17        | 35         | 12   | 1   |        | (8)   | (143)      | (+7)       |            | 3779 | 21  |
|        | 12540 | +34        | +12        | 34         | 170  | 1   | 19,767 | 12571 | -83        | -14        | 83         | 242  | 1   |
|        | 12540 | +36        | +16        | 37         | 12   | 1   | M-3    | 12570 | -66        | +13        | 66         | 61   | 1   |
|        | 12550 | +40        | -31        | 53         | 24   | 1   |        | 12570 | -64        | +16        | 64         | 48   | 1   |
|        | 12550 | +41        | -30        | 53         | 24   | 1   |        | 12570 | -62        | +13        | 62         | 48   | 1   |
|        | 12545 | +42        | +15        | 42         | 61   | 2   |        | 12568 | -58        | +10        | 58         | 24   | 1   |
|        | 12545 | +42        | +19        | 43         | 24   | 2   |        | 12568 | -58        | +11        | 58         | 36   | 1   |
|        | 12545 | +47        | +15        | 47         | 73   | 2   |        | 12563 | -36        | +17        | 36         | 48   | 2   |
|        | 12545 | +49        | +18        | 49         | 61   | 2   |        | 12563 | -35        | +20        | 37         | 267  | 7   |
|        | 12554 | +58        | -16        | 61         | 24   | 1   |        | 12563 | -32        | +18        | 33         | 267  | 6   |
|        | 12554 | +59        | -13        | 61         | 121  | 2   |        | 12563 | -29        | +17        | 30         | 48   | 2   |
|        | 12554 | +60        | -16        | 64         | 24   | 1   |        | 12563 | -27        | +17        | 28         | 218  | 10  |
|        | 12554 | +61        | -13        | 65         | 36   | 1   |        | 12563 | -26        | +16        | 27         | 424  | 8   |
|        | 12554 | +62        | -16        | 66         | 24   | 1   |        | 12563 | -25        | +12        | 26         | 12   | 1   |
|        | 12554 | +63        | -16        | 68         | 194  | 3   |        | 12563 | -22        | +13        | 23         | 48   | 1   |
|        | 12554 | +64        | -14        | 68         | 194  | 1   |        | 12556 | -29        | +32        | 37         | 36   | 1   |
|        | (15)  | (171)      | (+7)       |            | 3269 | 54  |        | 12556 | -27        | +30        | 33         | 24   | 1   |
| 17,887 | 12563 | -62        | +23        | 62         | 24   | 1   |        | 12556 | -19        | +33        | 32         | 48   | 1   |
| N-1    | 12563 | -59        | +22        | 59         | 242  | 1   |        | 12562 | -27        | +10        | 27         | 48   | 2   |
|        | 12563 | -58        | +20        | 58         | 109  | 1   |        | 12553 | +7         | -22        | 30         | 242  | 3   |
|        | 12563 | -57        | +18        | 57         | 242  | 1   |        | 12553 | +10        | -22        | 31         | 48   | 1   |
|        | 12563 | -55        | +24        | 56         | 48   | 1   |        | 12553 | +13        | -22        | 32         | 109  | 1   |
|        | 12563 | -53        | +17        | 53         | 339  | 2   |        | 12553 | +14        | -21        | 32         | 24   | 2   |
|        | 12563 | -53        | +19        | 53         | 170  | 2   |        | 12553 | +15        | -23        | 33         | 24   | 1   |
|        | 12563 | -51        | +16        | 51         | 194  | 1   |        | 12553 | +16        | -26        | 37         | 24   | 1   |
|        | 12562 | -52        | +11        | 52         | 145  | 1   |        | 12552 | +10        | -33        | 41         | 48   | 3   |
|        | 12556 | -42        | +33        | 47         | 97   | 1   |        | 12552 | +12        | -32        | 42         | 48   | 2   |
|        | 12553 | -19        | -22        | 36         | 194  | 1   |        | 12558 | +21        | -18        | 31         | 24   | 1   |
|        | 12553 | -13        | -21        | 31         | 194  | 1   |        | 12558 | +22        | -20        | 35         | 24   | 1   |
|        | 12552 | -15        | -32        | 42         | 242  | 2   |        | 12558 | +23        | -22        | 38         | 24   | 1   |
|        | 12558 | -7         | -22        | 30         | 97   | 1   |        | 12558 | +25        | -21        | 38         | 12   | 1   |
|        | 12558 | -3         | -21        | 29         | 97   | 2   |        | 12558 | +25        | -23        | 39         | 12   | 1   |
|        | 12558 | -2         | -24        | 32         | 48   | 1   |        | 12558 | +28        | -22        | 40         | 36   | 1   |
|        | 12558 | 0          | -22        | 30         | 145  | 1   |        | 12558 | +29        | -23        | 41         | 97   | 1   |



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| U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ |
|--------|-------|------------|------------|------------|------|-----|--------|-------|------------|------------|------------|------|-----|
|        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |
|        | 12566 | +27        | +19        | 28         | 24   | 1   |        | 12563 | +9         | +15        | 12         | 109  | 2   |
|        | 12566 | +32        | +18        | 33         | 48   | 1   |        | 12563 | +10        | +12        | 12         | 36   | 3   |
|        | 12548 | +29        | +22        | 32         | 145  | 1   |        | 12563 | +10        | +8         | 10         | 24   | 1   |
|        | 12569 | +60        | +22        | 61         | 24   | 1   |        | 12563 | +11        | +14        | 13         | 400  | 1   |
|        | 12569 | +64        | +20        | 64         | 48   | 1   |        | 12563 | +12        | +13        | 13         | 24   | 1   |
|        | 12540 | +80        | +11        | 80         | 170  | 2   |        | 12553 | +42        | -23        | 51         | 73   | 1   |
|        |       |            |            |            |      |     |        | 12553 | +50        | -22        | 58         | 97   | 1   |
|        | (13)  | (128)      | (+7)       |            | 3202 | 76  |        | 12548 | +63        | +22        | 63         | 194  | 1   |
| 20,547 | 12571 | -70        | -16        | 72         | 145  | 1   |        | (8)   | (91)       | (+7)       |            | 2144 | 36  |
| N-2    | 12570 | -56        | +12        | 56         | 24   | 1   | 23,535 | 12573 | -54        | -28        | 62         | 121  | 1   |
|        | 12570 | -51        | +12        | 51         | 36   | 1   | N-2    | 12573 | -53        | -28        | 61         | 36   | 1   |
|        | 12568 | -48        | +10        | 48         | 24   | 1   |        | 12573 | -49        | -27        | 58         | 291  | 1   |
|        | 12563 | -26        | +19        | 28         | 218  | 2   |        | 12571 | -29        | -14        | 37         | 194  | 1   |
|        | 12563 | -24        | +19        | 27         | 73   | 1   |        | 12563 | +13        | +18        | 18         | 315  | 3   |
|        | 12563 | -23        | +18        | 26         | 218  | 2   |        | 12563 | +15        | +22        | 21         | 61   | 1   |
|        | 12563 | -22        | +16        | 24         | 194  | 1   |        | 12563 | +16        | +20        | 20         | 145  | 1   |
|        | 12563 | -19        | +16        | 21         | 73   | 1   |        | 12563 | +17        | +19        | 20         | 145  | 1   |
|        | 12563 | -17        | +17        | 19         | 170  | 3   |        | 12563 | +18        | +17        | 20         | 85   | 6   |
|        | 12563 | -16        | +15        | 18         | 630  | 2   |        | 12563 | +22        | +16        | 23         | 97   | 1   |
|        | 12563 | -10        | +14        | 12         | 24   | 1   |        | 12563 | +23        | +14        | 23         | 364  | 1   |
|        | 12562 | -17        | +10        | 17         | 48   | 1   |        | 12563 | +27        | +16        | 27         | 85   | 1   |
|        | 12553 | +16        | -22        | 32         | 121  | 3   |        | 12553 | +56        | -23        | 62         | 48   | 1   |
|        | 12553 | +21        | -22        | 37         | 24   | 1   |        | 12548 | +77        | +22        | 77         | 291  | 1   |
|        | 12553 | +23        | -21        | 38         | 145  | 2   |        | (5)   | (78)       | (+7)       |            | 2278 | 21  |
|        | 12553 | +26        | -23        | 39         | 24   | 1   | 24,657 | 12577 | -62        | +11        | 62         | 218  | 1   |
|        | 12558 | +31        | -20        | 41         | 12   | 1   | N-1    | 12577 | -61        | +9         | 61         | 121  | 1   |
|        | 12558 | +32        | -18        | 40         | 12   | 1   |        | 12577 | -58        | +11        | 58         | 48   | 1   |
|        | 12558 | +38        | -23        | 48         | 109  | 2   |        | 12576 | -44        | -14        | 49         | 145  | 1   |
|        | 12566 | +37        | +18        | 38         | 12   | 1   |        | 12573 | -40        | -27        | 51         | 97   | 1   |
|        | 12566 | +42        | +18        | 43         | 24   | 1   |        | 12573 | -32        | -26        | 47         | 291  | 1   |
|        | 12548 | +38        | +22        | 40         | 194  | 1   |        | 12571 | -13        | -14        | 27         | 267  | 2   |
|        | (9)   | (118)      | (+7)       |            | 2554 | 32  |        | 12563 | +28        | +17        | 29         | 170  | 1   |
| 21,535 | 12572 | -77        | +13        | 77         | 97   | 1   |        | 12563 | +29        | +19        | 31         | 97   | 1   |
| N-2    | 12571 | -56        | -15        | 59         | 291  | 1   |        | 12563 | +30        | +19        | 32         | 121  | 1   |
|        | 12570 | -38        | +12        | 38         | 48   | 2   |        | 12563 | +32        | +18        | 33         | 145  | 1   |
|        | 12568 | -34        | +10        | 34         | 24   | 1   |        | 12563 | +40        | +14        | 40         | 485  | 1   |
|        | 12563 | -12        | +19        | 18         | 145  | 2   |        | (5)   | (63)       | (+7)       |            | 2205 | 13  |
|        | 12563 | -9         | +18        | 13         | 291  | 1   | 25,586 | 12580 | -88        | +27        | 88         | 388  | 1   |
|        | 12563 | -8         | +16        | 12         | 97   | 3   | M-4    | 12580 | -84        | +26        | 84         | 97   | 1   |
|        | 12563 | -6         | +15        | 10         | 97   | 1   |        | 12580 | -80        | +24        | 80         | 679  | 3   |
|        | 12563 | -2         | +14        | 8          | 291  | 2   |        | 12581 | -82        | +13        | 82         | 242  | 1   |
|        | 12563 | +2         | +14        | 8          | 24   | 1   |        | 12579 | -73        | -31        | 80         | 485  | 3   |
|        | 12563 | +3         | +12        | 8          | 48   | 1   |        | 12579 | -73        | -29        | 80         | 145  | 1   |
|        | 12553 | +29        | -22        | 41         | 97   | 1   |        | 12579 | -71        | -28        | 79         | 291  | 1   |
|        | 12553 | +37        | -22        | 48         | 97   | 1   |        | 12578 | -57        | -30        | 65         | 12   | 1   |
|        | 12552 | +35        | -33        | 52         | 24   | 1   |        | 12577 | -50        | +12        | 50         | 242  | 1   |
|        | 12548 | +50        | +22        | 51         | 218  | 1   |        | 12577 | -48        | +11        | 48         | 24   | 1   |
|        | 12558 | +52        | -23        | 60         | 97   | 1   |        | 12577 | -47        | +9         | 47         | 109  | 4   |
|        | (9)   | (105)      | (+7)       |            | 1986 | 21  |        | 12577 | -43        | +12        | 43         | 97   | 3   |
| 22,578 | 12573 | -66        | -27        | 71         | 121  | 4   |        | 12577 | -42        | +10        | 42         | 73   | 1   |
| N-3    | 12573 | -62        | -26        | 69         | 267  | 1   |        | 12576 | -36        | -15        | 41         | 121  | 7   |
|        | 12571 | -42        | -14        | 48         | 194  | 1   |        | 12576 | -33        | -16        | 41         | 12   | 1   |
|        | 12570 | -27        | +14        | 28         | 24   | 1   |        | 12576 | -30        | -13        | 37         | 194  | 6   |
|        | 12568 | -20        | +11        | 20         | 12   | 1   |        | 12573 | -27        | -27        | 42         | 85   | 3   |
|        | 12575 | -7         | +12        | 8          | 12   | 1   |        | 12573 | -19        | -25        | 38         | 145  | 1   |
|        | 12563 | +2         | +19        | 12         | 158  | 2   |        | 12573 | -19        | -23        | 38         | 48   | 1   |
|        | 12563 | +3         | +22        | 18         | 48   | 2   |        | 12571 | -1         | -14        | 22         | 145  | 2   |
|        | 12563 | +3         | +16        | 10         | 24   | 2   |        | 12570 | +14        | +13        | 17         | 24   | 3   |
|        | 12563 | +4         | +19        | 12         | 315  | 9   |        | 12563 | +41        | +17        | 42         | 48   | 3   |
|        | 12563 | +6         | +17        | 11         | 12   | 1   |        |       |            |            |            |      |     |



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| U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U. T.  | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ |
|--------|-------|------------|------------|------------|------|-----|--------|-------|------------|------------|------------|------|-----|
|        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |
|        | 12563 | +42        | +19        | 43         | 61   | 7   |        | 12573 | 0          | -26        | 32         | 48   | 1   |
|        | 12563 | +42        | +21        | 43         | 24   | 2   |        | 12573 | +2         | -26        | 33         | 48   | 1   |
|        | 12563 | +43        | +20        | 44         | 73   | 2   |        | 12573 | +5         | -27        | 33         | 73   | 2   |
|        | 12563 | +46        | +18        | 47         | 97   | 1   |        | 12573 | +8         | -24        | 32         | 170  | 1   |
|        | 12563 | +54        | +13        | 54         | 376  | 2   |        | 12573 | +8         | -26        | 33         | 73   | 3   |
|        | (10)  | (51)       | (+7)       |            | 4337 | 63  |        | 12571 | +25        | -14        | 33         | 170  | 1   |
| 26,537 | 12580 | -77        | +24        | 77         | 194  | 1   |        | 12563 | +67        | +22        | 67         | 24   | 1   |
| N-3    | 12580 | -75        | +22        | 75         | 145  | 1   |        | 12563 | +68        | +21        | 68         | 48   | 1   |
|        | 12580 | -74        | +24        | 74         | 291  | 1   |        | 12563 | +80        | +14        | 80         | 582  | 1   |
|        | 12580 | -68        | +23        | 68         | 776  | 2   |        | (10)  | (25)       | (+7)       |            | 5440 | 54  |
|        | 12581 | -77        | +14        | 77         | 109  | 1   | 28,541 | 12586 | -61        | +24        | 61         | 85   | 1   |
|        | 12581 | -69        | +12        | 69         | 218  | 1   | N-2    | 12586 | -59        | +24        | 60         | 24   | 1   |
|        | 12579 | -62        | -32        | 71         | 485  | 3   |        | 12586 | -57        | +23        | 57         | 97   | 1   |
|        | 12579 | -60        | -30        | 68         | 194  | 1   |        | 12581 | -49        | +14        | 49         | 48   | 1   |
|        | 12579 | -56        | -31        | 66         | 24   | 1   |        | 12581 | -49        | +16        | 49         | 242  | 4   |
|        | 12577 | -39        | +11        | 39         | 267  | 7   |        | 12581 | -41        | +12        | 41         | 218  | 1   |
|        | 12577 | -35        | +12        | 35         | 48   | 2   |        | 12580 | -50        | +26        | 52         | 36   | 1   |
|        | 12577 | -34        | +8         | 34         | 85   | 2   |        | 12580 | -50        | +24        | 51         | 97   | 1   |
|        | 12577 | -31        | +11        | 31         | 36   | 2   |        | 12580 | -49        | +23        | 50         | 85   | 1   |
|        | 12577 | -30        | +10        | 30         | 121  | 2   |        | 12580 | -48        | +22        | 49         | 73   | 1   |
|        | 12576 | -23        | -15        | 32         | 36   | 1   |        | 12580 | -48        | +24        | 50         | 533  | 1   |
|        | 12576 | -21        | -16        | 31         | 48   | 3   |        | 12580 | -44        | +24        | 46         | 145  | 2   |
|        | 12576 | -17        | -13        | 27         | 291  | 2   |        | 12580 | -43        | +23        | 46         | 145  | 1   |
|        | 12573 | -14        | -26        | 37         | 97   | 2   |        | 12580 | -40        | +23        | 42         | 412  | 1   |
|        | 12573 | -7         | -24        | 32         | 194  | 1   |        | 12580 | -38        | +24        | 41         | 242  | 2   |
|        | 12573 | -6         | -26        | 33         | 12   | 1   |        | 12579 | -37        | -32        | 52         | 630  | 1   |
|        | 12571 | +11        | -14        | 25         | 145  | 1   |        | 12579 | -33        | -29        | 48         | 364  | 4   |
|        | 12582 | +47        | +24        | 48         | 12   | 1   |        | 12579 | -33        | -34        | 52         | 73   | 1   |
|        | 12563 | +51        | +18        | 51         | 24   | 1   |        | 12579 | -30        | -32        | 48         | 121  | 1   |
|        | 12563 | +52        | +17        | 52         | 24   | 1   |        | 12577 | -11        | +11        | 12         | 291  | 8   |
|        | 12563 | +52        | +22        | 52         | 24   | 1   |        | 12577 | -9         | +10        | 9          | 24   | 1   |
|        | 12563 | +54        | +21        | 54         | 73   | 2   |        | 12577 | -8         | +9         | 8          | 24   | 2   |
|        | 12563 | +57        | +19        | 57         | 24   | 1   |        | 12577 | -4         | +11        | 6          | 24   | 1   |
|        | 12563 | +67        | +14        | 67         | 485  | 1   |        | 12577 | -3         | +9         | 3          | 36   | 1   |
|        | (9)   | (38)       | (+7)       |            | 4482 | 46  |        | 12577 | -2         | +10        | 3          | 170  | 4   |
| 27,537 | 12586 | -75        | +25        | 75         | 109  | 2   |        | 12576 | +7         | -13        | 21         | 48   | 1   |
| N-2    | 12586 | -70        | +23        | 70         | 24   | 1   |        | 12576 | +7         | -15        | 23         | 61   | 2   |
|        | 12580 | -65        | +23        | 65         | 24   | 1   |        | 12576 | +10        | -13        | 22         | 291  | 2   |
|        | 12580 | -64        | +25        | 65         | 242  | 1   |        | 12573 | +12        | -27        | 37         | 97   | 3   |
|        | 12580 | -61        | +22        | 61         | 85   | 1   |        | 12573 | +19        | -27        | 39         | 97   | 3   |
|        | 12580 | -60        | +25        | 60         | 412  | 1   |        | 12573 | +21        | -24        | 38         | 121  | 2   |
|        | 12580 | -57        | +23        | 57         | 291  | 2   |        | 12573 | +21        | -26        | 39         | 73   | 3   |
|        | 12580 | -53        | +23        | 54         | 412  | 2   |        | 12571 | +37        | -11        | 41         | 36   | 1   |
|        | 12580 | -51        | +24        | 52         | 145  | 2   |        | 12571 | +38        | -14        | 42         | 170  | 1   |
|        | 12581 | -62        | +14        | 62         | 48   | 1   |        | (8)   | (12)       | (+7)       |            | 5233 | 62  |
|        | 12581 | -62        | +18        | 62         | 48   | 1   | 29,587 | 12586 | -49        | +25        | 50         | 61   | 1   |
|        | 12581 | -54        | +12        | 54         | 242  | 1   | N-2    | 12586 | -48        | +25        | 50         | 24   | 1   |
|        | 12579 | -49        | -31        | 60         | 582  | 3   |        | 12581 | -37        | +17        | 38         | 339  | 6   |
|        | 12579 | -48        | -34        | 61         | 73   | 1   |        | 12581 | -28        | +12        | 28         | 218  | 2   |
|        | 12579 | -47        | -28        | 57         | 267  | 4   |        | 12580 | -37        | +24        | 39         | 679  | 1   |
|        | 12585 | -46        | +12        | 46         | 12   | 1   |        | 12580 | -32        | +24        | 35         | 218  | 1   |
|        | 12577 | -25        | +11        | 25         | 315  | 4   |        | 12580 | -32        | +22        | 36         | 61   | 1   |
|        | 12577 | -23        | +10        | 23         | 48   | 1   |        | 12580 | -30        | +23        | 33         | 242  | 1   |
|        | 12577 | -18        | +11        | 18         | 97   | 2   |        | 12580 | -27        | +23        | 30         | 388  | 1   |
|        | 12577 | -18        | +9         | 18         | 85   | 1   |        | 12580 | -24        | +24        | 30         | 376  | 3   |
|        | 12577 | -17        | +10        | 17         | 97   | 4   |        | 12579 | -23        | -31        | 45         | 679  | 2   |
|        | 12576 | -9         | -14        | 23         | 12   | 1   |        | 12579 | -20        | -32        | 45         | 24   | 1   |
|        | 12576 | -8         | -13        | 22         | 61   | 1   |        | 12579 | -19        | -28        | 39         | 339  | 6   |
|        | 12576 | -8         | -15        | 23         | 97   | 1   |        | 12579 | -14        | -30        | 40         | 97   | 1   |
|        | 12576 | -3         | -13        | 21         | 303  | 1   |        | 12579 | -13        | -32        | 42         | 48   | 1   |
|        | 12573 | -2         | -26        | 32         | 73   | 1   |        | 12585 | -21        | +13        | 22         | 48   | 2   |



## AUGUST

| U.T.   | No.   | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ | U.T. | No.    | $\Delta l$ | $\varphi$  | $\rho$     | $A$  | $s$ |   |
|--------|-------|------------|------------|------------|------|-----|------|--------|------------|------------|------------|------|-----|---|
|        |       | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |      |        | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |      |     |   |
|        | 12585 | -17        | +13        | 17         | 109  | 1   |      | 12577  | +25        | +10        | 25         | 36   | 1   |   |
|        | 12577 | 0          | +11        | 3          | 85   | 1   |      | 12576  | +32        | -13        | 39         | 48   | 1   |   |
|        | 12577 | +2         | +12        | 7          | 145  | 1   |      | 12576  | +34        | -12        | 39         | 121  | 3   |   |
|        | 12577 | +3         | +13        | 8          | 97   | 3   |      | 12576  | +35        | -13        | 40         | 194  | 2   |   |
|        | 12577 | +3         | +11        | 6          | 73   | 1   |      | 12573  | +38        | -25        | 50         | 24   | 1   |   |
|        | 12577 | +6         | +12        | 8          | 73   | 3   |      | 12573  | +40        | -25        | 50         | 97   | 2   |   |
|        | 12577 | +6         | +9         | 7          | 24   | 1   |      | 12573  | +40        | -27        | 51         | 194  | 1   |   |
|        | 12577 | +8         | +10        | 8          | 24   | 2   |      | 12573  | +47        | -26        | 56         | 97   | 2   |   |
|        | 12577 | +10        | +10        | 11         | 24   | 1   |      | 12573  | +48        | -24        | 57         | 267  | 2   |   |
|        | 12577 | +12        | +10        | 12         | 145  | 2   |      | 12571  | +65        | -14        | 68         | 97   | 1   |   |
|        | 12576 | +19        | -15        | 29         | 61   | 2   |      |        | (10)       | (346)      | (+7)       | 5777 | 74  |   |
|        | 12576 | +21        | -14        | 30         | 61   | 3   |      | 31,588 | 12586      | -22        | +25        | 28   | 24  | 1 |
|        | 12576 | +23        | -14        | 32         | 279  | 4   | N-2  | 12581  | -11        | +18        | 16         | 73   | 1   |   |
|        | 12573 | +24        | -26        | 40         | 36   | 2   |      | 12581  | -9         | +16        | 12         | 291  | 6   |   |
|        | 12573 | +32        | -27        | 46         | 48   | 4   |      | 12581  | -8         | +18        | 12         | 24   | 1   |   |
|        | 12573 | +33        | -26        | 47         | 24   | 1   |      | 12581  | -5         | +17        | 11         | 85   | 1   |   |
|        | 12573 | +35        | -24        | 47         | 194  | 1   |      | 12581  | -5         | +15        | 10         | 97   | 2   |   |
|        | 12573 | +36        | -26        | 48         | 97   | 1   |      | 12581  | -4         | +13        | 8          | 12   | 1   |   |
|        | 12571 | +51        | -15        | 56         | 121  | 1   |      | 12581  | -3         | +14        | 9          | 24   | 1   |   |
|        | (9)   | (358)      | (+7)       |            | 5561 | 66  |      | 12581  | -3         | +12        | 8          | 24   | 1   |   |
| 30,534 | 12586 | -38        | +27        | 41         | 61   | 1   |      | 12581  | 0          | +14        | 8          | 97   | 3   |   |
| N-2    | 12586 | -37        | +24        | 39         | 85   | 1   |      | 12581  | +1         | +12        | 6          | 485  | 5   |   |
|        | 12581 | -25        | +18        | 27         | 145  | 1   |      | 12580  | -11        | +26        | 22         | 97   | 1   |   |
|        | 12581 | -23        | +17        | 25         | 194  | 3   |      | 12580  | -9         | +25        | 21         | 364  | 3   |   |
|        | 12581 | -23        | +14        | 24         | 12   | 1   |      | 12580  | -8         | +26        | 21         | 48   | 1   |   |
|        | 12581 | -20        | +18        | 22         | 73   | 1   |      | 12580  | -7         | +23        | 18         | 121  | 2   |   |
|        | 12581 | -15        | +12        | 17         | 242  | 4   |      | 12580  | -2         | +23        | 18         | 255  | 4   |   |
|        | 12581 | -12        | +12        | 14         | 48   | 1   |      | 12580  | -1         | +23        | 18         | 97   | 1   |   |
|        | 12580 | -24        | +24        | 30         | 606  | 3   |      | 12580  | +1         | +23        | 17         | 242  | 1   |   |
|        | 12580 | -20        | +24        | 26         | 170  | 2   |      | 12580  | +4         | +23        | 17         | 315  | 1   |   |
|        | 12580 | -18        | +23        | 23         | 339  | 3   |      | 12579  | +2         | -30        | 38         | 533  | 1   |   |
|        | 12580 | -14        | +23        | 22         | 412  | 2   |      | 12579  | +8         | -28        | 36         | 145  | 1   |   |
|        | 12580 | -10        | +24        | 21         | 339  | 1   |      | 12579  | +9         | -29        | 38         | 48   | 1   |   |
|        | 12579 | -12        | -33        | 42         | 24   | 1   |      | 12589  | +4         | -17        | 24         | 12   | 1   |   |
|        | 12579 | -11        | -30        | 39         | 533  | 1   |      | 12589  | +7         | -18        | 25         | 24   | 2   |   |
|        | 12579 | -7         | -28        | 36         | 242  | 5   |      | 12589  | +11        | -18        | 27         | 61   | 2   |   |
|        | 12579 | -2         | -29        | 37         | 48   | 1   |      | 12585  | +8         | +13        | 11         | 48   | 3   |   |
|        | 12585 | -8         | +13        | 10         | 24   | 1   |      | 12585  | +13        | +14        | 16         | 121  | 1   |   |
|        | 12585 | -7         | +12        | 8          | 48   | 1   |      | 12577  | +29        | +12        | 29         | 145  | 1   |   |
|        | 12585 | -4         | +14        | 9          | 97   | 1   |      | 12577  | +31        | +12        | 31         | 97   | 1   |   |
|        | 12585 | -3         | +13        | 8          | 121  | 2   |      | 12577  | +34        | +13        | 35         | 48   | 2   |   |
|        | 12589 | -7         | -19        | 27         | 85   | 2   |      | 12577  | +34        | +11        | 34         | 97   | 2   |   |
|        | 12589 | -6         | -18        | 26         | 24   | 2   |      | 12577  | +36        | +12        | 36         | 145  | 1   |   |
|        | 12589 | -4         | -18        | 25         | 36   | 1   |      | 12577  | +38        | +11        | 38         | 145  | 1   |   |
|        | 12577 | +12        | +11        | 13         | 61   | 3   |      | 12577  | +40        | +10        | 40         | 24   | 1   |   |
|        | 12577 | +14        | +12        | 16         | 145  | 2   |      | 12576  | +51        | -13        | 55         | 218  | 1   |   |
|        | 12577 | +14        | +13        | 16         | 48   | 1   |      | 12573  | +52        | -27        | 61         | 145  | 1   |   |
|        | 12577 | +17        | +12        | 17         | 73   | 2   |      | 12573  | +54        | -28        | 62         | 121  | 1   |   |
|        | 12577 | +18        | +12        | 19         | 24   | 1   |      | 12573  | +56        | -24        | 62         | 194  | 2   |   |
|        | 12577 | +18        | +13        | 19         | 73   | 1   |      | 12573  | +58        | -27        | 64         | 97   | 1   |   |
|        | 12577 | +19        | +10        | 19         | 24   | 1   |      | 12573  | +62        | -24        | 69         | 145  | 1   |   |
|        | 12577 | +21        | +12        | 22         | 73   | 1   |      |        | (9)        | (332)      | (+7)       | 5388 | 65  |   |
|        | 12577 | +23        | +11        | 23         | 73   | 4   |      |        |            |            |            |      |     |   |

Mean for 31 days,  $A = 3310$ ,  $r = 142.5$